

**Methods:** Single-surgeon (senior author), retrospective case review of procedure time (retrieved from theatre computer logs) for patients undergoing tympanoplasty, or primary tympanomastoid surgery for cholesteatoma, during a period of transition from conventional open to a principally endoscopic ear surgery practice.

**Results:** 109 patients (7–85yrs) underwent tympanoplasty/primary cholesteatoma surgery. Entirely endoscopic technique in 22/42 tympanoplasty and 29/67 cholesteatoma procedures. Mean operative time for endoscopic tympanoplasty was 77.7 mins.(range 41–126 mins.), for open procedures 95.3 mins.(range 50–120 mins.). Endoscopic approach was quicker compared to open surgery ( $p = 0.031$ ). In mastoid surgery the mean surgical time was 154 mins.(range 91–205 mins.) for the endoscopic technique and 169 mins. (64–259 mins.) for open surgery. There was no significant difference between these two groups ( $p = 0.082$ ).

**Conclusion:** Operative time is not a drawback when transitioning from a conventional open to predominately EES otology practice. For tympanoplasty procedures it is significantly faster utilising the endoscopic approach. Endoscopic mastoid surgery has similar time to conventional techniques.

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#### ID: IP140

##### Lemierre's syndrome: a difficult diagnosis

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**Learning Objectives:** We aim to identify early features common to cases of Lemierre's syndrome to facilitate prompt diagnosis and treatment.

**Introduction:** Lemierre's syndrome is an uncommon, but potentially deadly, complication of common infections of the throat and ear involving thrombophlebitis of the internal jugular vein. Oropharyngeal and auricular infections are some of the most commonly presenting illnesses so physicians must be aware of this diagnosis. However it may be easily missed as early signs are often subtle and non-specific.

**Methods:** We highlight the difficulty faced in the diagnosis of Lemierre's by presenting the case of a 15 year old boy admitted with sepsis from chronic otitis media, alongside a review of the literature.

**Results:** As seen with our patient, a common theme in cases of Lemierre's is late diagnosis. He was found to have septic

pulmonary emboli on CT pulmonary angiogram after developing breathlessness. From our literature review, the features that can aid early recognition include; headache, neck ache, tenderness over sternocleidomastoid muscle, trismus, chest crepitations and Fusobacterium grown from blood cultures. Later signs include dyspnoea, desaturations, pleuritic chest pain and other signs of septic pulmonary emboli which prompt chest imaging.

**Conclusions:** Due to the potentially fatal consequences of Lemierre's syndrome, a high index of suspicion should be applied to patients with oropharyngeal or ear infections where symptoms do not settle with 24 hours of antibiotics or where pain, trismus or chest symptoms and signs are seen. We recommend the use of CT or US to screen for IJV thrombosis earlier in the clinical course of these infections.

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#### ID: IP141

##### Endoscope-assisted microsurgery for cholesteatoma removal

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**Learning Objectives:**

**Introduction:** Endoscopes can facilitate surgery within the facial recess, sinus tympani, and deep part of the round window niche, which are not fully visualized under an operating microscope. We investigated whether using endoscope-assisted dissection of cholesteatoma gave a lower incidence of cholesteatoma recurrence than using microscopic dissection only.

**Methods:** Four patients with middle ear cholesteatoma were operated on by using intact canal-wall techniques, canal-wall reconstruction techniques, or transcanal approaches assisted by endoscope-guided dissection. Eleven patients were operated on by using the same techniques but under an operating microscope alone. Comparison of group (A) microscopic surgery assisted by endoscope-guided dissection, with group (B) microscopic surgery only.

**Main Outcome Measures:** Rates of cholesteatoma recurrence, controlling for the site of the initial cholesteatoma and whether the tumor was detected by second-stage surgery or by non-echo-planar-imaging diffusion-weighted MRI.

**Results:** Five patients in group B (5/11, 45%) had cholesteatoma recurrences in a follow up of 1 year that needed to be surgically removed. No group A patients (0/4, 0%) developed cholesteatoma recurrences in that period.

**Conclusions:** In those techniques with canal-wall techniques, canal-wall reconstruction techniques, or transcanal approaches, most surgical failures occur within the tympanic cavity and its hard-to-reach extensions, rather than within the mastoid. Using an endoscope enables us to see inside the facial recess, sinus tympani, and deep part of the round window niche, which are not fully visible under an operating microscope, thus leading to lower rates of cholesteatoma recurrence. These areas are minimally accessible even with extensive postauricular mastoidectomy. Microscopic surgery assisted by endoscope-guided dissection is therefore useful in such cases.

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#### ID: IP142

### Use of the apparent diffusion coefficient of conventional echo-planar imaging to differentiate between cholesteatomas and infectious lesions of the temporal bone

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#### Learning Objectives:

**Introduction:** As therapeutic alternatives and technologies have advanced, the use of non-invasive modes of therapy to avoid surgery has increased. From this perspective the focus of this study was to evaluate the diagnostic benefit of the ADC in conventional echo-planar magnetic resonance imaging (MRI) as a means of differentiating between cholesteatomas and inflammatory lesions.

**Methods:** We evaluated three patients with suspected temporal-bone cholesteatomas, one infected cholesteatoma and three with inflammatory lesions by using MRI, including standard T2-weighted spin-echo and echo-planar DW/ADC sequences, and computed tomography (CT) as aligned with regions of interest (ROIs) determined in DW imaging. The ADC values in the selected ROIs were calculated by using a 2-point linear regression method ( $b = 0$  and  $b = 1000 \text{ s/mm}^2$ ). To test the reliability, all measurements were performed twice; the coefficient of correlation was 0.94.

**Results:** Three of the patients with suspected cholesteatoma and one patient with temporal-lobe abscessation due to temporal-bone inflammatory lesions subsequently underwent surgical confirmation and excision or drainage of their lesions. The ADC values were  $0.759\text{--}0.915 \times 10^{-3} \text{ mm}^2/\text{s}$  (mean,  $0.840 \times 10^{-3} \pm 0.0586 \text{ mm}^2/\text{s}$ ) for cases of uninfected cholesteatoma,  $0.538\text{--}0.573 \times 10^{-3} \text{ mm}^2/\text{s}$  (mean,  $0.555 \times 10^{-3} \pm 0.0141 \text{ mm}^2/\text{s}$ ) for infected cholesteatomas, and  $0.905\text{--}1.272 \times 10^{-3} \text{ mm}^2/\text{s}$  (mean,  $1.063 \times 10^{-3} \pm 0.123 \text{ mm}^2/\text{s}$ ) for inflammatory lesions. These ADC

values differed significantly (one-way analysis of variance:  $F(2,11) = 18.1, P < 0.05$ ).

**Conclusions:** The ADC value can be used preoperatively to differentiate between temporal-bone cholesteatomas compared with infectious lesions. However, T2-weighted, FIESTA, or CISS images must be matched carefully to temporal-bone CT scans to accurately define ROIs.

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#### ID: IP143

### Surgical treatment for markedly advanced petrous apex cholesteatoma via the translabyrinthine and trans-sphenoidal approach

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#### Learning Objectives:

**Introduction:** Cholesteatoma is one of the most frequent lesions in the petrous portion of the temporal bone. It is difficult to completely remove the lesions of the petrous apex, specifically cholesteatoma. Selection of a surgical approach is determined by the location of the cholesteatoma in the petrous bone. We report a case of an intractable petrous apex cholesteatoma, which was managed with combined surgery, involving a translabyrinthine approach and trans-sphenoidal approach.

**Case report:** A 71-year-old Japanese man underwent right tympanoplasty 6 years previously. He visited our hospital because of recurrent cholesteatoma. He could not hear because of obstruction of the right external auditory meatus caused by the previous surgery. Computed tomography (CT) revealed a soft tissue density lesion that extended widely from the petrous portion of the temporal bone to the sphenoid sinus. Cholesteatoma had extensively spread to the nearby carotid artery and posterior cranial fossa. It was considered difficult to completely remove this lesion. Surgery was performed via a translabyrinthine approach to remove most of the cholesteatoma. A trans-sphenoidal approach was used to create a drainage and observation hole. The post-operative course was uneventful, and the remainder of his clinical course was benign. Post-operative CT findings after 10 months revealed that the drainage route leads to the petrous portion of the temporal bone.

**Conclusions:** We encountered a markedly advanced, intractable petrous apex cholesteatoma. A surgical procedure, including trans-sphenoidal approach can maintain debris drainage and facilitate observation of the lesion from the